

REMARKS

Applicant respectfully requests reconsideration of this application in view of the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in substantially the same order in which the corresponding issues were raised in the Office Action.

Status of the Claims

Claims 1-5 and 7-24 are pending. No claims are currently amended. Claims 11-24 are canceled. No claims are added. No new matter has been added. Claims 2-5 currently stand withdrawn from consideration by the Examiner; however, Applicant reserves the right to reinstate some or all of the withdrawn claims, as may be applicable, upon allowance of a generic or sub-generic claim.

Summary of the Office Action

Claims 1 and 7-10 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as his invention.

Claims 1, 7, 8, and 10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,778,214 to Toma (hereinafter "Toma")

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Toma in view of U.S. Patent No. 4,814,848 to Akimoto et al. (hereinafter "Akimoto").

Response to Rejections under 35 U.S.C. § 112, second paragraph

Claims 1 and 7-10 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as his invention. In particular, the Office Action states that the word "substantially" in claim 1 purportedly does not adequately define the metes and bounds of the claim because it is not clear how much of the region must be under the polysilicon gate electrode.

The M.P.E.P. acknowledges that the term "substantially" is definite when used in view of general guidelines contained in the specification or when understood by one

skilled in the art. M.P.E.P. § 2173.05(b). Here, the term “substantially” can be understood in view of the specification because Figures 10a and 10b provide exemplary embodiments in which a collecting region 3 is shown substantially under a polysilicon gate 7. Additionally, Applicant submits that one skilled in the art would understand what is meant by “substantially” as it is recited in claim 1. Accordingly, Applicant respectfully requests that the rejection of claim 1 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Response to Rejections under 35 U.S.C. §§ 102(b) and 103(a)

The Office Action rejected claims 1, 7, 8, and 10 under 35 U.S.C. § 102(b) as being anticipated by Toma. The Office Action also rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Toma in view of Akimoto. Applicant respectfully requests withdrawal of these rejections because the cited reference fails to disclose all of the limitations of the claims.

CLAIMS 1 and 7-10

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Toma. Applicant respectfully submits that claim 1 is patentable over the cited reference because Toma does not disclose all of the limitations of the claim. Claim 1 recites:

A pixel structure comprising:

a semiconductor substrate;

a radiation sensitive source of carriers in the substrate;

a region in the substrate for collecting but not storing the carriers;

at least one doped or inverted region of a first conductivity in or on the substrate; and

at least one planar current flow, carrier transport pathway from or through the region in the substrate for collecting but not storing carriers, to the at least one doped or inverted region, in which carrier transport pathway carriers are not stored, there being no means for storing carriers in between the region for collecting but not storing carriers and the at least one planar current flow, carrier transport pathway, wherein substantially all of the region for collecting but not storing carriers is under a polysilicon gate electrode.

(Emphasis added).

Applicant respectfully submits Toma fails to disclose all of the limitations of the claim. In particular, Toma does not disclose at least one planar current flow, carrier

transport pathway from or through the region in the substrate for collecting but not storing carriers, to the at least one doped or inverted region.

Toma is directed to leakage of signal charges stored in photodiodes during read operations. Toma, Abstract. In particular, the Office Action refers to Figure 6A, which depicts a representative cell structure for a photodiode. Toma, col. 15, lines 7-10. The cell structure includes a p-type semiconductor substrate 19 and an n-type semiconductor region 20, constituting a portion of the photodiode. The cell structure also includes another n-type semiconductor region 21, constituting the vertical transfer path, and an interposed region 22 between the photodiode and the vertical transfer path. Toma, col. 15, lines 11-16.

In reference to Figure 2B, which depicts an analogous cell structure to the cell structure of Figure 6A, Toma describes how the signal charges are transferred during exposure from the photodiode to the vertical transfer path. Toma, col. 7, lines 42-59. In particular, signal charges stored in the photodiode are read out to the vertical transfer paths via the transfer gates, or interposed regions. In other words, the interposed region 22 transfers the signal charges from the photodiode (n-type semi-conductor region 20) to the vertical transfer path (n-type semi-conductor region 21). The interposed region 22 does not transfer signal charges from the vertical transfer path to the photodiode.

Since the Office Action designates the left side of the interposed region 22 as purportedly being the same as the claimed region for collecting but not storing carriers, and designates the photodiode 20 as purportedly being the same as the claimed doped or inverted region, Toma does not disclose at least one planar current flow, carrier transport pathway from or through the region in the substrate for collecting but not storing carriers, to the at least one doped or inverted region because such operation would be backwards from what Toma describes. Alternatively, if the Office Action were to reverse the designations, Toma nevertheless would not disclose substantially all of the photodiode 20 as being under a polysilicon gate electrode.

Furthermore, Applicant respectfully disagrees that any part of the interposed region 22 might be designated as a region for collecting but not storing carriers. The only function of the interposed region 22 disclosed by Toma appears to be merely transferring the signal charge between the adjacent n-type semiconductor regions. Toma does not

disclose the interposed region 22 as collecting, or otherwise attracting, the signal charge. Rather, the signal charge is collected and stored at the photodiode 20.

In contrast, claim 1 recites “at least one planar current flow, carrier transport pathway from or through the region in the substrate for collecting but not storing carriers, to the at least one doped or inverted region.” For the reasons stated above, Toma fails to disclose all of the limitations of claim 1. In particular, Toma does not disclose at least one planar current flow, carrier transport pathway from or through the region in the substrate for collecting but not storing carriers, to the at least one doped or inverted region. Given that the cited reference fails to disclose all of the limitations of the claim, Applicant respectfully submits that claim 1 is patentable over the cited reference. Accordingly, Applicant requests that the rejection of claim 1 under 35 U.S.C. § 102(b) be withdrawn.

Given that claims 7-10 depend from independent claim 1, which is patentable over the cited reference, Applicant respectfully submits that dependent claims 7-10 are also patentable over the cited reference. Accordingly, Applicant requests that the rejection of claims 7, 8, and 10 under 35 U.S.C. § 102(b) and the rejection of claim 9 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

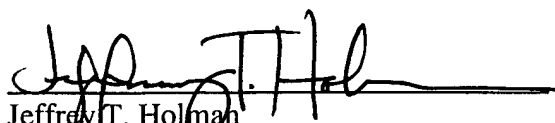
It is respectfully submitted that in view of the remarks set forth herein, the rejections have been overcome. If the Examiner believes a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Jeffrey Holman at (408) 720-8300.

If there are any additional charges, please charge them to Deposit Account No. 02-2666.

Respectfully submitted,

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